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IS : 4700 - 1968
(Reaffirmed 1994)
REAFFIRMED
- 1999

Indian Standard

QUALITY TOLERANCES FOR WATER FOR FERMENTATION INDUSTRY

REAFFIRMED
- 2012

(Third Reprint JUNE 2000)

UDC 663.6 : 663.1

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2 *October* 1968

AMENDMENT NO. 1 JUNE 1981

TO

IS : 4700 - 1968 QUALITY TOLERANCES FOR WATER FOR FERMENTATION INDUSTRY

Addendum

[*Page* 4, *Table* 2, *Sl No.* (xxi)] — Add the following new matte under respective columns after Sl No. (xxi) :

‘ (1)	(2)	(3)	(4)
xxii)	Cadmium (as Cd), mg/l, *Max*	0·01	*See* Note
xxiii)	Mercury (as Hg), mg/l, *Max*	0·001	*See* Note

NOTE — Methods of test for these characteristics are under preparation, till then methods of test as given in Standard Methods for the examination of water and wastewater, 1975. American Public Health Association; American Water Works Association; and Water Pollution Control Federation, USA, shall be followed.’

(CDC 26)

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Indian Standard

QUALITY TOLERANCES FOR WATER FOR FERMENTATION INDUSTRY

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(*Continued from page* 1)

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Indian Standard

QUALITY TOLERANCES FOR WATER FOR FERMENTATION INDUSTRY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 June 1968, after the draft finalized by the Water Sectional Committee had been approved by the Chemical Division Council.

0.2 Water is used in the fermentation industry for brewing and distilling and for general purposes, such as washing. In the brewery, water is used for (a) brewing, (b) boiler feed, (c) bottle and keg washing and pasteurizing, and (d) cooling. In the distillery, water is used for (a) mash making, (b) cooling of masher and condenser, (c) boiler feed, and (d) deproofing. This standard is intended to guide the fermentation industry in judging the suitability of a particular supply of water for that industry and in planning the type of treatment required for available supplies of water.

0.3 The requirements for water for boiler feed purposes are covered in IS : 1680-1960*.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the quality tolerances for water used in fermentation industry (brewing, distillery, antibiotics and citric acid manufacture).

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*Code of practice for treatment of water for land boilers. (Since revised).

†Rules for rounding off numerical values (*revised*).

2. TOLERANCES

2.1 The water shall comply with the tolerances for its bacteriological and physical and chemical quality, and for radioactivity as given in Tables 1 to 3. In addition, the water shall also comply with the tolerances given in Table 4 for the particular operations specified in the table for brewing and in Table 5 for the particular operations specified for distillery industry.

TABLE 1 BACTERIOLOGICAL TOLERANCES

Sl No.	Characteristic	Tolerance	Method of Test (Ref to Cl No. in IS : 1622-1964*)
(1)	(2)	(3)	(4)
i)	Coliform bacteria, MPN index per 100 ml	Zero	3.2
ii)	Standard plate count/ml, *Max*	100	5

*Methods for sampling and test for microbiological examination of water used in industry.

TABLE 2 PHYSICAL AND CHEMICAL TOLERANCES

Sl No.	Characteristic	Tolerance	Method of Test (Ref to Cl No. in IS : 3025-1964*)
(1)	(2)	(3)	(4)
i)	Turbidity (units), *Max*	10	6
ii)	Colour (Hazen units), *Max*	20	5
iii)	Odour	None	7
iv)	Total solids, mg/l, *Max*	1 000	10
v)	Total hardness (as $CaCO_3$), mg/l, *Max*	500	16
vi)	Chlorides (as Cl), mg/l, *Max*	250	24
vii)	Sulphates (as SO_4), mg/l, *Max*	200	20
viii)	Iron (as Fe), mg/l, *Max*	0·3	32
ix)	Manganese (as Mn), mg/l, *Max*	0·2	35
x)	Copper (as Cu), mg/l, *Max*	1·0	36
xi)	Zinc (as Zn), mg/l, *Max*	15	39
xii)	Magnesium (as Mg); mg/l, *Max*	125	34
xiii)	*p*H	6·0-9·2	8
xiv)	Fluorides (as F), mg/l, *Max*	1·5	23
xv)	Nitrates (as N), mg/l, *Max*	20	48
xvi)	Phenolic substances (as C_6H_5OH), mg/l, *Max*	0·001	54
xvii)	Arsenic (as As), mg/l, *Max*	0·2	40
xviii)	Chromium (as Cr^6), mg/l, *Max*	0·05	38
xix)	Cyanide (as CN), mg/l, *Max*	0·01	27
xx)	Lead (as Pb), mg/l, *Max*	0·1	37
xxi)	Selenium (as Se), mg/l, *Max*	0·05	28

*Methods of sampling and test (physical and chemical) for water used in industry.

TABLE 3 TOLERANCE FOR RADIOACTIVITY

Sl No.	Characteristic	Tolerance	Method of Test (Ref to Cl No. in IS : 3025-1964*)
(1)	(2)	(3)	(4)
i)	Alpha emitters, µc/ml, *Max*	10^{-9}	58
ii)	Beta emitters, µc/ml, *Max*	10^{-8}	58

*Methods of sampling and test (physical and chemical) for water used in industry.

TABLE 4 ADDITIONAL TOLERANCES FOR WATER FOR BREWING

Sl No.	Characteristic	Tolerance			Method of Test (Ref to Cl No. in IS : 3025-1964*)
		Brewing		Pasteurizing	
		Light	Dark		
(1)	(2)	(3)	(4)	(5)	(6)
i)	Total solids, mg/l, *Max*	500	—	—	10
ii)	Carbonate hardness (as $CaCO_3$), mg/l, *Max*	—	—	Zero	17
iii)	Alkalinity (as $CaCO_3$), mg/l, *Max*	75	150	—	13
iv)	Calcium (as Ca), mg/l	100-200	60-150	—	33
v)	Chloride (as NaCl), mg/l, *Max*	275	275	—	24
vi)	*p*H	6·5-7·0	Not less than 7·0	—	8
vii)	Manganese (as Mn), mg/l, *Max*	0·1	0·1	—	35

*Methods of sampling and test (physical and chemical) for water used in industry.

TABLE 5 ADDITIONAL TOLERANCES FOR WATER FOR DISTILLERY INDUSTRY

Sl No.	Characteristic	Tolerance		Method of Test (Ref to Cl No. in IS : 3025-1964*)
		Mashing	Deproofing	
(1)	(2)	(3)	(4)	(5)
i)	Total solids, mg/l, *Max*	—	Nil (Demineralized water or water of distilled quality preferred)	10
ii)	Total hardness (as $CaCO_3$), mg/l, *Max*	150-250	—	16
iii)	Carbonate hardness (as $CaCO_3$), mg/l	50-100	—	17

*Methods of sampling and test (physical and chemical) for water used in industry.

3. SAMPLING

3.1 Representative samples of water shall be drawn as prescribed in IS: 1622-1964* and IS: 3025-1964†.

4. TEST METHODS

4.1 Tests shall be carried out as prescribed in the appropriate clauses of IS: 1622-1964* and IS: 3025-1964† as indicated against the characteristics in Tables 1 to 5.

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*Methods of sampling and test for microbiological examination of water used in industry.

†Methods of sampling and test (physical and chemical) for water used in industry.